

WHAT IS CLAIMED IS:

1. An audio signal encoding apparatus comprising:
means for adding a first audio signal and a second audio signal
5 into an addition-result signal;
means for subtracting the first audio signal from the second
audio signal, and generating a subtraction-result signal;
means responsive to the addition-result signal for generating a
first difference signal representing a difference in the addition-
10 result signal;
means responsive to the subtraction-result signal for
generating a second difference signal representing a difference in
the subtraction-result signal;
a plurality of first predictors having different prediction
15 characteristics respectively and being responsive to the first
difference signal for generating first different prediction signals for
the first difference signal, respectively;
a plurality of first subtracters for generating first prediction-
error signals representing differences between the first difference
20 signal and the first different prediction signals, respectively;
means for selecting a first minimum prediction-error signal
representative of a smallest difference from among the first
prediction-error signals;
a plurality of second predictors having different prediction
25 characteristics respectively and being responsive to the second
difference signal for generating second different prediction signals

for the second difference signal, respectively;

a plurality of second subtractors for generating second prediction-error signals representing differences between the second difference signal and the second different prediction

5 signals, respectively; and

means for selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals.

10 2. An audio signal encoding apparatus as recited in claim 1, further comprising means for generating a variable-rate bit stream in response to the first minimum prediction-error signal and the second minimum prediction-error signal.

15 3. An audio signal decoding apparatus for processing a first minimum prediction-error signal and a second minimum prediction-error signal which are generated by an audio signal encoding apparatus comprising means for adding a first audio signal and a second audio signal into an addition-result signal; means for
20 subtracting the first audio signal from the second audio signal, and generating a subtraction-result signal; means responsive to the addition-result signal for generating a first difference signal representing a difference in the addition-result signal; means responsive to the subtraction-result signal for generating a second difference signal representing a difference in the subtraction-result signal; a plurality of first predictors having different prediction
25 signals; and means for combining the first difference signal and the second difference signal to generate a third difference signal.

- characteristics respectively and being responsive to the first difference signal for generating first different prediction signals for the first difference signal, respectively; a plurality of first subtracters for generating first prediction-error signals
- 5 representing differences between the first difference signal and the first different prediction signals, respectively; means for selecting a first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals; a plurality of second predictors having different prediction characteristics
- 10 respectively and being responsive to the second difference signal for generating second different prediction signals for the second difference signal, respectively; a plurality of second subtracters for generating second prediction-error signals representing differences between the second difference signal and the second different prediction signals, respectively; and means for selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals; the audio signal decoding apparatus comprising:
- means for recovering the addition-result signal from the first minimum prediction-error signal;
- means for recovering the subtraction-result signal from the second minimum prediction-error signal; and
- means for recovering the first audio signal and the second audio signal from the recovered addition-result signal and the recovered subtraction-result signal.
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4. A method comprising the steps of:
 - adding a first audio signal and a second audio signal into an addition-result signal;
 - subtracting the first audio signal from the second audio signal,
- 5 and generating a subtraction-result signal;
 - generating a first difference signal representing a difference in the addition-result signal;
 - generating a second difference signal representing a difference in the subtraction-result signal;
- 10 generating first different prediction signals for the first difference signal, respectively;
 - generating first prediction-error signals representing differences between the first difference signal and the first different prediction signals, respectively;
- 15 selecting a first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals;
 - generating second different prediction signals for the second difference signal, respectively;
- 20 generating second prediction-error signals representing differences between the second difference signal and the second different prediction signals, respectively;
 - selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals; and
 - transmitting the first minimum prediction-error signal and
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the second minimum prediction-error signal to a communication line.

5. An optical recording medium storing formatted information of
5 a first minimum prediction-error signal and a second minimum prediction-error signal which are generated by an audio signal encoding apparatus comprising means for adding a first audio signal and a second audio signal into an addition-result signal; means for subtracting the first audio signal from the second audio signal, and
10 generating a subtraction-result signal; means responsive to the addition-result signal for generating a first difference signal representing a difference in the addition-result signal; means responsive to the subtraction-result signal for generating a second difference signal representing a difference in the subtraction-result
15 signal; a plurality of first predictors having different prediction characteristics respectively and being responsive to the first difference signal for generating first different prediction signals for the first difference signal, respectively; a plurality of first subtracters for generating first prediction-error signals
20 representing differences between the first difference signal and the first different prediction signals, respectively; means for selecting a first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals; a plurality of second predictors having different prediction characteristics
25 respectively and being responsive to the second difference signal for generating second different prediction signals for the second

- difference signal, respectively; a plurality of second subtracters for generating second prediction-error signals representing differences between the second difference signal and the second different prediction signals, respectively; and means for selecting a second
- 5 minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals.
6. A method of network-based transmission, comprising the steps of:
- 10 adding a first audio signal and a second audio signal into an addition-result signal;
- subtracting the first audio signal from the second audio signal, and generating a subtraction-result signal;
- generating a first difference signal representing a difference
- 15 in the addition-result signal;
- generating a second difference signal representing a difference in the subtraction-result signal;
- generating first different prediction signals for the first difference signal, respectively;
- 20 generating first prediction-error signals representing differences between the first difference signal and the first different prediction signals, respectively;
- selecting a first minimum prediction-error signal representative of a smallest difference from among the first
- 25 prediction-error signals;
- generating second different prediction signals for the second

difference signal, respectively;

generating second prediction-error signals representing differences between the second difference signal and the second different prediction signals, respectively;

- 5 selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals; and

transmitting the first minimum prediction-error signal and the second minimum prediction-error signal to a communication
10 line.

7. An audio signal encoding apparatus comprising:

means for selecting a first audio signal and a second audio signal from among signals composing a multi-channel audio signal;

- 15 means for adding the first audio signal and the second audio signal into an addition-result signal;

means for subtracting the first audio signal from the second audio signal, and generating a subtraction-result signal;

- 20 means responsive to the addition-result signal for generating a first difference signal representing a difference in the addition-result signal;

means responsive to the subtraction-result signal for generating a second difference signal representing a difference in the subtraction-result signal;

- 25 a plurality of first predictors having different prediction characteristics respectively and being responsive to the first

difference signal for generating first different prediction signals for the first difference signal, respectively;

a plurality of first subtracters for generating first prediction-error signals representing differences between the first difference

5 signal and the first different prediction signals, respectively;

means for selecting a first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals;

a plurality of second predictors having different prediction
10 characteristics respectively and being responsive to the second difference signal for generating second different prediction signals for the second difference signal, respectively;

a plurality of second subtracters for generating second prediction-error signals representing differences between the
15 second difference signal and the second different prediction signals, respectively; and

means for selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals.

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8. An audio signal encoding apparatus as recited in claim 7, further comprising means for generating a variable-rate bit stream in response to the first minimum prediction-error signal and the second minimum prediction-error signal.

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9. An audio signal decoding apparatus for processing a first

minimum prediction-error signal and a second minimum prediction-error signal which are generated by an audio signal encoding apparatus comprising means for selecting a first audio signal and a second audio signal from among signals composing a

5 multi-channel audio signal; means for adding the first audio signal and the second audio signal into an addition-result signal; means for subtracting the first audio signal from the second audio signal, and generating a subtraction-result signal; means responsive to the addition-result signal for generating a first difference signal

10 representing a difference in the addition-result signal; means responsive to the subtraction-result signal for generating a second difference signal representing a difference in the subtraction-result signal; a plurality of first predictors having different prediction characteristics respectively and being responsive to the first

15 difference signal for generating first different prediction signals for the first difference signal, respectively; a plurality of first subtracters for generating first prediction-error signals representing differences between the first difference signal and the first different prediction signals, respectively; means for selecting a

20 first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals; a plurality of second predictors having different prediction characteristics respectively and being responsive to the second difference signal for generating second different prediction signals for the second

25 difference signal, respectively; a plurality of second subtracters for generating second prediction-error signals representing differences

between the second difference signal and the second different prediction signals, respectively; and means for selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals; the

5 audio signal decoding apparatus comprising:

means for recovering the addition-result signal from the first minimum prediction-error signal;

means for recovering the subtraction-result signal from the second minimum prediction-error signal; and

10 means for recovering the first audio signal and the second audio signal from the recovered addition-result signal and the recovered subtraction-result signal.

10. A method comprising the steps of:

15 selecting a first audio signal and a second audio signal from among signals composing a multi-channel audio signal;

adding the first audio signal and the second audio signal into an addition-result signal;

subtracting the first audio signal from the second audio signal,

20 and generating a subtraction-result signal;

generating a first difference signal representing a difference in the addition-result signal;

generating a second difference signal representing a difference in the subtraction-result signal;

25 generating first different prediction signals for the first difference signal, respectively;

generating first prediction-error signals representing differences between the first difference signal and the first different prediction signals, respectively;

- selecting a first minimum prediction-error signal
5 representative of a smallest difference from among the first prediction-error signals;

generating second different prediction signals for the second difference signal, respectively;

- generating second prediction-error signals representing
10 differences between the second difference signal and the second different prediction signals, respectively;

selecting a second minimum prediction-error signal
representative of a smallest difference from among the second prediction-error signals; and

- 15 transmitting the first minimum prediction-error signal and the second minimum prediction-error signal to a communication line.

11. An optical recording medium storing formatted information of
20 a first minimum prediction-error signal and a second minimum prediction-error signal which are generated by an audio signal encoding apparatus comprising means for selecting a first audio signal and a second audio signal from among signals composing a multi-channel audio signal; means for adding the first audio signal and the second audio signal into an addition-result signal; means for subtracting the first audio signal from the second audio signal, and

- generating a subtraction-result signal; means responsive to the addition-result signal for generating a first difference signal representing a difference in the addition-result signal; means responsive to the subtraction-result signal for generating a second difference signal representing a difference in the subtraction-result signal; a plurality of first predictors having different prediction characteristics respectively and being responsive to the first difference signal for generating first different prediction signals for the first difference signal, respectively; a plurality of first subtracters for generating first prediction-error signals representing differences between the first difference signal and the first different prediction signals, respectively; means for selecting a first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals; a plurality of second predictors having different prediction characteristics respectively and being responsive to the second difference signal for generating second different prediction signals for the second difference signal, respectively; a plurality of second subtracters for generating second prediction-error signals representing differences between the second difference signal and the second different prediction signals, respectively; and means for selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals.
- 25 12. A method of network-based transmission, comprising the steps of:

- selecting a first audio signal and a second audio signal from among signals composing a multi-channel audio signal;
- adding the first audio signal and the second audio signal into an addition-result signal;
- 5 subtracting the first audio signal from the second audio signal, and generating a subtraction-result signal;
- generating a first difference signal representing a difference in the addition-result signal;
- generating a second difference signal representing a difference in the subtraction-result signal;
- 10 generating first different prediction signals for the first difference signal, respectively;
- generating first prediction-error signals representing differences between the first difference signal and the first different prediction signals, respectively;
- 15 selecting a first minimum prediction-error signal representative of a smallest difference from among the first prediction-error signals;
- generating second different prediction signals for the second difference signal, respectively;
- 20 generating second prediction-error signals representing differences between the second difference signal and the second different prediction signals, respectively;
- selecting a second minimum prediction-error signal representative of a smallest difference from among the second prediction-error signals; and

transmitting the first minimum prediction-error signal and the second minimum prediction-error signal to a communication line.